

as beneath their attention, objects which—however minute they may be—annually pick the pockets of our American farmers of hundreds of millions of dollars.

ROCK ISLAND, ILL., June 15, 1866.

ANSWERS TO CORRESPONDENTS.

BY B. D. WALSH, M. A.—ASSOCIATE EDITOR.

Notice.—Through the fault of Uncle Sam's Post-office, answers to correspondents—whom and how many I cannot tell—have miscarried between Illinois and Philadelphia. Those that find their communications unnoticed, will, therefore, please repeat them.

Thos. C. Wright, Ohio.—The insects sent, which had bored extensively into seasoned Hickory wood, are the same Painted Borer (*Clytus pictus*) as I figured in my Article on Borers, (P. E. No. 4, p. 29), only it is the male which is there figured, and the specimens you send are both females, and consequently have much shorter antennae. They belong to the Order of Beetles, (*Coleoptera*), not to the Order of Bugs, (*Heteroptera*), as you conjecture, and have the usual transformations of their Order. The specimens sent reached Philadelphia alive and kicking, but were dead when I received them five days afterwards.

H. B. Howarth, Wis.—The insects you now send are not the true Chinch-bugs, though they belong to the same family, (*Lygaeidae*), and have nearly the same habits. The Chinch-Bug is mostly black, with his back whitish, and a very conspicuous pair of black spots placed crosswise on it; those sent are of a uniform greenish-gray color with no conspicuous markings. This species is very common and abundant, but so far as I am aware, has not been as yet named and described. In size and shape it resembles the Chinch-bug; but the coloring is very different. About half of what you sent were winged, and in the perfect or full-grown state; the rest were the same insect in the larva or baby state. I have never known this species breed in excessive numbers, as the Chinch-Bug commonly does; but no doubt, in proportion to their numbers, they are equally destructive to vegetation.

Chas. H. W. Wood, Mass.—Thanks for the Cankerworms which reached me in good order, considering that they were four days on the road. You say of these Cankerworms that the principal trouble is to keep the full grown or growing worms from the trees, and that the protectors or tar stops the females from ascending. But these "full-grown or growing-worms" must have been hatched on the trees; else what did they live on before they were full-grown? I take it that they are individuals that have been blown off the trees by the wind or washed off by the rain, and afterwards re-ascend by the trunk. The real trouble, as I apprehend, is, that you don't apply your tarred bandages early enough in the season. Many females of this species come out in November, or on fine warm days through the winter; and to stop these from climbing the trees the tar must be attended to from the end of the autumn every fine spell through the winter. It is true this is a deal of trouble; but if done *effectually* and *thoroughly* one season in any neighborhood, you annihilate your foe for a dozen years to come. Recollect that the female is wingless, and cannot migrate at pleasure into your orchard from the other end of the County, like the winged female moth of the common "Caterpillar."

I do not believe that the male Cankerworm moth, when coupled with the female, would ever fly into trees, so as to give the female a chance to lay her eggs there. Butterflies and Dragon-flies (Snake-feeders and Devil's darning-needles) commonly fly coupled, but I never saw any moth do so. It requires very strong and robust wings to carry double in this manner.

Chas. Cook, Mass.—Dr. Clemens writes me word that the small moth produced from your cocoons is not, as I had supposed, undescribed. It is his *Bucculatrix pomifoliella*, described by him several years back, and the larva feeds on the leaves of apple-trees, as indeed the name indicates.

M. V. B. Hathaway, Vermont.—You inquire "what is the name and character of the insect which deposits froth resembling spittle upon grass in spring." It belongs to the Order *Homoptera*, the Family *Cercopidae* and the genus *Aphrophora*, which in English means "foam-bearer." Near Rock Island we have three species, the 4-notata of Say, and the *quadragularis* of Say, which are both pretty common and resemble each other pretty closely, and the *biliventa* of Say which is rare; besides the *obtusus* of Say and the *Proteus* of Fitch which are now referred to a different genus—*Clastoptera*—with different habits. The "froth" you speak of is caused by the young larva pumping out through the pores of its body the sap of the plant on which it feeds, and no doubt answers the purpose of concealing it from birds, cannibal insects, &c. You will always find a single larva in the middle of the froth, wingless of course, or with mere rudiments of wings; the perfect insect having full-sized wings. The ancients believed that this froth was "cuckoo-spit," and our French and English ancestors called it "frog-spittle," supposing of course that the tree-frogs voided it from their mouths. I have noticed this "froth" very abundant on the Red Osier Dogwood, (Cornus), but which species of *Aphrophora* infests that shrub, I do not know, having never bred the perfect insect from the spittle. I never saw any "froth" upon "grass," as you say you have; but likely enough you may have a different species in Vermont from any found in Illinois. You could easily breed the perfect insect by placing the infested grass-plant in a pot of earth, and covering it with musketo-bar. But mind how you handle him, when he comes out in the perfect state, for he jumps like any flea; as indeed do all the Homopterous insects belong to the *Cercopis* and *Tettigonia* and *Membracis* families—or as they have been called in English the "Frog-hoppers," the "Leaf-hoppers," and the "Tree-hoppers." I have read somewhere that *Clastoptera Proteus* (of Fitch), which is prettily marked with black and gamboge-yellow, is a great pest upon cranberry vines in the East; but it must attack other plants as well, for it is very common near Rock Island where there are no cranberry vines.

E. Hall, Athens, Ill.—The insects you send are indeed the true, highly improved, new Potato-bug, and Athens being so far in the interior of the State, the fact that they had already reached it a year ago is a confirmation of what I asserted last spring, viz.—that they would travel eastward at the rate of about fifty miles a year till they reached the Atlantic. There are two kinds of beetles that infest the Sweet Potato, one of a gold color, and the other striped with pale yellow and black. Both belong to the family of Tortoise-beetles, (*Cassida*), so called from their flatness, and are, as you infer, pretty closely allied to the new Potato Bug. The pink ladybirds with black spots that you send, and which you say destroy the eggs of the Potato-bug, are *Hippodamia maculata*—one of the most useful friends the farmer has, for he is death on bark-lice, on chinch-bugs, and on Potato-bug's eggs. Several other kinds of Ladybirds also, to my knowledge, feed on Potato-bug's eggs.

Although, as you say, the Potato-bug first appeared with you last year on *Solanum triflorum*, a plant that you have been growing from Rocky Mountain seed since 1863, yet you could not have imported it along with the seed, because the seed must of course have been gathered in the fall, and this insect's eggs, if gathered in the fall, would not live till the following spring. Some insects indeed pass the winter in the egg state, the common "Caterpillar" of the apple-tree for example, but this is not one of them.

O. B. Douglas, Vermont.—The plum with some monstrosity in its development arrived in such a shrivelled state that I can make nothing of it. The small "bunches or sacks" attached to a twig are very remarkable and quite new to me. They contain eggs and are made by some insect or other—or possibly some spider—and that is all I can say about them. I have found on the White Oak numerous "bunches or sacks" likewise containing eggs, but differing from yours in being smoothly globular and of a cream-color, freckled with brown.

Prof. Sheldon, Iowa.—The moth you send is a fine male of the common Currant Borer, (*Agryia tipuliformis*), of which a figure was given in the P. E., p. 29, together with a short notice by myself of its habits.

Dr. Trimble, N. J.—I have already answered you once, but the MS. miscarried. The large larva you send, with the statement that it is destroying many dwarf pear-trees near Hammon, N. J. by boring them close to the ground, is manifestly that of some Longicorn Beetle, and I think belongs to the *Prionus* group. As it disagrees with the described larvæ of the genus *Prionus* in having very long maxillary palpi and long antennæ, I think it will not improbably prove to be the larva of *Orthosoma cylindricum*, which with us in Illinois is a pretty common insect. Authors indeed state that this species inhabits pine-trees; but I think this must be a mistake. It is common near Rock Island, where we have no pine-trees. True, it might breed here in pine lumber, of which we have plenty. But in 1861 I took great numbers of this insect near the inland town of Jonesboro', in South Illinois, where at that date they had neither pine-trees nor pine lumber, the natives of that region using "poplar" (tulip-tree) or "whitewood," where the northern folks who live handy to the pineries use pine. *Prionus laticollis*, as you are aware, breeds in different species of Poplar. *Prionus imbricornis* is our common species in Illinois, but where that breeds is, I believe, unknown. Your larva arrived in good order, and I hope to raise the perfect insect from it, and settle all doubts on the above question.

F. K. Phoenix, Illinois.—The cankerworm moths mostly come out in the spring and lay their eggs then, but a few come out late in the autumn and on warm days through the winter and of course lay their eggs shortly afterwards. This is what all the best writers say.

Fred. Blanchard, Mass.—You ask, "what are the most desirable works on Entomology for the beginner to have." Answer—Kirby and Spence's *Introduction to Entomology*, London, 1857, one thick duodecimo. Harris's *Injurious Insects*, one octavo volume, with plates. Westwood's *Introduction to Classification of Insects*, London, 1838—40; two thick octavo volumes, with very numerous outline drawings.

Thos. Siveter, Iowa.—Thanks for the Cankerworms, most of which arrived in good health. The Potato Bugs you send are the genuine new and highly improved species—quite distinct from the old-fashioned blister beetles—respecting which see my Article in No. 1 of P. E. They are swarming this year at Rock Island, and last autumn I heard that they had already reached a point thirty miles to the South East of us. We have to thank the Eastern folks for the Bark-louse, the Locust-borer, the Hessian Fly and the Wheat midge. Now we are going to reciprocate the obligation, and furnish them with a Western Bug with true, go-ahead, western propensities. "Turn about is fair play."

Henry Shimer, Illinois.—The insects infesting the White Pine (*Pinus strobus*) that you forward do not belong to the *Aphis* family, (Plant-lice) as you suppose, but to the *Coccus* family (Bark-lice). The elongate white scale on the leaf was described by Fitch as *Aspidiotus pinifoliae*; the downy patches on the bark as *Coccus pinicorticis*. But I believe they are the same species, the former containing the eggs, like the scale of the common Bark-louse of the apple tree, and the latter being the young larvæ with downy matter exuding from them. No one has yet obtained the winged males of this species; and until this is done the genus to which it belongs cannot be accurately determined. I suppose you are aware that the females in this family never acquire wings, and that the males, unlike the 4-winged Plant-lice, have only two wings. There was a large green cannibal larva, belonging to the Dipterous family *Syrphidae*, that came along with the lice and was probably unnoticed by you.

Errata in No. 8.

Page 77, column 1, line 4, for "*Serica tricolor*" read "*Serica iricolor*."

Page 77, column 2, line 24 from bottom, for "all the true Bugs" read "almost all the true Bugs."

Page 78, column 1, line 3, for "without food" read "without teeth."

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Distribution and Habitat of Insects.

The distribution of insects is in exact proportion to the diffusion of plants; the richer any country is in plants, the richer it is also in insects. The polar regions, which produce but few plants, have also but few insects; whereas the luxuriant vegetation of the tropical countries feeds a numerous host of insects.

With respect to their habitation, insects are divided into those which live upon land and water.

Those which live in the water, either never leave that element, or are able to live at will, either in the water or on the earth, at least for a short time; for example, many water-beetles. Many live at certain periods of their development in water; at others, on land; such as many sorts of flies, and all the dragon-flies, which as larvæ and pupæ live in water, but as perfect insects on land, or in the air.

Land insects live either in the earth, under stones, in decayed wood, or in putrid animal substances. Of these some pass their whole lives in these places, others only during a particular period of their development. The larvæ of the dung-beetle live deep under the ground, while the perfect insect inhabits the excrement of animals; many of the larvæ of flies live in carrion or excrement, while the perfect insect flies about in the open air. A very great number choose the different parts of plants for their abode, as the roots, bark, inner bark, albumum, wood, pith, buds, flowers, leaves and fruit. They change their abode in every new stage of their development. Thus the bark-beetle, which in the larva state lived under the bark, swarms in its perfect state upon the trees, the curculio of the apple-tree, the larva of which infests the bottom of the apple blossom, crawls on the trees, or on the surrounding ground; the mining-moth, which as a larva lives under the cuticle of the leaves, flutters in its winged state about the flowers and leaves.

A small number live upon other animals, on the skin, such as lice, or in the inside of the body, as the ox and horse breeze-flies (*Estridæ*). The two latter leave their first abode before entering the pupa state, which they effect in the earth, and hover as flies round the animals to deposit their eggs upon them.

Most insects live solitarily, either without any definite dwelling, or they construct for themselves a house composed of various kinds of vegetables or animal matter; for example, many caterpillars. A few species live in society, such as bees, ants, wasps, &c.

By obtaining a general knowledge of the abode of insects, it is evident that the observer of the economy of insects will be able more satisfactorily to combat many that are injurious to him; thus he can, with little trouble, greatly diminish or entirely annihilate those that he has ascertained to live in society, or in places of easy access.—*Kollar*.

We have copies of the "Practical Entomologist," published in Philadelphia, from which we glean valuable information. Success to such a work.—*California Farmer*.